



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,663	09/15/2003	Patrick W. Goodwill	INT-11	1854
32509	7590	06/21/2005	EXAMINER	
CARRIE A. BOONE, P.C. 2450 LOUISIANA SUITE 400-310 HOUSTON, TX 77006				CHANG, AUDREY Y
ART UNIT		PAPER NUMBER		
		2872		

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/662,663	GOODWILL, PATRICK W. 
Examiner	Art Unit	
Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 30 March 2005.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-55 is/are pending in the application.

4a) Of the above claim(s) 11-22,28-45,48-51,54 and 55 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-10,23-27,46,47,52 and 53 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. _____.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s) .

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species A (Figure 1) in the reply filed on March 30, 2005 is acknowledged. The traversal is on the ground(s) that the disclosed species are different embodiments but not different species. This is not found persuasive because: Figures 1-2 of the specification discloses a species of diffraction grating (100) having movable beams that are connected to *two long beams*, Figures 5-6, discloses a species of grating (200) having movable beams that are supported by *a single long beams*, and Figures 7-9 discloses a species of grating (300) having movable beams that are supported by a *plurality of individually controlled long beams* such that they are all *mutually exclusive* species to each other. Also diffraction grating (100) and (200) has only one-dimensional grating structure and the diffraction grating (300) has two dimensional grating structure, that further makes them mutually exclusive to each other. Furthermore, between Figures 1 and 2, 5 and 6, 7 and 9, the specification then discloses that the *diffraction grating* can be either achieved by "actuating" the movement or "not actuating" the movable member, which makes them also mutually exclusive from each other since one of the species discloses the diffraction is based on setting *finite* height difference between movable beams and stationary beams and the other species discloses the diffraction is *not* based on the finite height difference. Figures 9A to 9E then drawn to different and mutually exclusive arrangements of the square wells. The restriction therefore is proper since the different figures are corresponding to mutually exclusive species and the applicant fails to state and to provide arguments to show that they are **obvious variations** to one another.

The restriction therefore is FINAL.

2. **Claims 11-22, 28-45, 48-51 and 54-55 are withdrawn** from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species there being no allowable generic or linking claim.

Art Unit: 2872

Applicant timely traversed the restriction (election) requirement in the reply filed on March 30, 2005.

The applicant is respectfully noted that for the reasons stated above claims 11-12 are drawn to *non-elected species* since the diffraction grating is set up by not-actuating the movable member which is *mutually exclusive* from the elected species as stated in claim 1. Claims 54-55 are drawn to the same species as claims 28, which is therefore also *mutually exclusive* from the elected species as stated in claim 1.

3. Claims 1-10, 23-27, 46-47 and 52-53 remain pending in this application.

Claim Objections

4. **Claim 2 is objected to** under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The feature concerning the plurality of cross beams coupled to the two long beams has already been claimed in its based claim.

5. **Claims 1-10, 23-27, 46-47 and 52-53 are objected to because of the following informalities:**

(1). The phrase “diffraction *parallel* to the long beams” recited in claims 1 and 52, the phrase “diffraction *parallel* to the one or more long beams” recited in claim 23, and the phrase “diffraction *parallel* to the at least one long beams” recited in claim 46 are confusing and indefinite since it is not clear what does it mean by “diffraction *parallel* to the ... long beams”. Does it means the diffracted light is along the beam or what? The diffraction is caused by the phase modulation caused by the movable member and stationary beams and it is not clear how does the diffraction be *parallel* to the long beams?

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Furlani et al (PN. 5,991,079).**

Furlani et al teaches a *diffraction grating* that is comprised of a *movable component* with a plurality of *cross beams* (20, Figures 1-6), coupled to *two long beams* (44) wherein the two long beams are *parallel* to each other and a *stationary component* that is comprised of a plurality of *protecting beams* (36) wherein the cross beams (20) and the stationary projecting beams (36) are alternatively disposed. Furlani et al teaches that the movable component is *actuated* to set up a plurality of *square wells* by make the difference in height distance between the cross beams and the stationary beams to be at a quarter of the wavelength of an incident light so that the light is diffracted by the square wells, (please see Figures 3 and 6, column 3, lines 45-67).

With regard to claims 2-3, the plurality of cross beams (20, Figure 1) is coupled to the two long beams (44) and there is a base pieces (30) for coupling the plurality of projecting beams (36, Figure 1).

This reference has therefore anticipated the claims.

8. **Claims 23-27 and 46-47 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Bloom et al (PN. 5,677,783).**

Bloom et al teaches a *diffraction grating* that is comprised of a plurality of *movable beams* (34, Figures 8-9) *alternatively arranged and moved* by a moving means such as electromagnetic force,

Art Unit: 2872

between a plurality of *stationary beams* (32), wherein as shown in Figure 10, the plurality of movable beams are coupled to one or more long beams. Bloom et al teaches that a plurality of square wells are formed, (please see Figure 9) when the plurality of movable beams are *actuated* so that a separation distance (d) equals to quarter of wavelength of the incident light, is set between the surfaces of the movable beams and the stationary beams, and the diffraction of the light beams occurs as the light strikes the square wells, (please see Figures 8-10, column 8 lines 49-67). With regard to claim 46, the stationary beams are *projecting beams* as shown in Figures 8 and 9.

With regard to claim 24, each of the stationary beams (32) is coupling to a support (36, Figures 8-9).

With regard to claim 25, the movable beams are moved by setting up different voltage to give non-zero electromagnetic force.

With regard to claims 26-27 and 47, Bloom et al teaches that the surfaces of the movable beams and the stationary beams are each coated with a *reflective layer* (38) for reflecting the incident light.

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bloom et al in view of the patent issued to Furlani et al.**

Bloom et al teaches a *diffraction grating* that is comprised of a plurality of *movable beams* (34, Figures 8-9), serves as the *cross beams*, that is *alternatively arranged and moved* by a moving means such as electromagnetic force, between a plurality of *stationary beams* (32). The stationary beams are *projecting beams* as shown in Figures 8 and 9. Bloom et al teaches that a plurality of square wells are formed, (please see Figure 9) when the plurality of the cross beams are *actuated* so that a separation distance (d) equals to a quarter of wavelength of the incident light, is set between the surfaces of the cross beams and the stationary beams, and the diffraction of the light beams occurs as the light strikes the square wells, (please see Figures 8-10, column 8 lines 49-67).

This reference has met all the limitations of the claims. Bloom et al teaches that (as shown in Figures 1 and 10), the plurality of movable beams are coupled to one or more long beams but it does not teach explicitly that they are coupled to two long beams. **Furlani** et al in the same field of endeavor teaches a diffraction grating comprising a plurality of movable beams alternatively arranged with a plurality of stationary beams wherein the movable beams are formed by cross beams coupled to two long beams, (please see Figure 1). It would then have been obvious to one skilled in the art to apply the teachings **Furlani** et al to modify the structure of Bloom et al to make the movable beams coupled to two long beams for the benefit of providing more evenly and accurately control of the movement and the position of the movable beams.

With regard to claim 3, Bloom et al teaches that a base (40) is used to couple the projecting beams.

With regard to claims 4-6, Bloom et al teaches that the surfaces of the movable beams and the stationary beams are each coated with a reflective layer (38). The diffraction grating can be arranged to make the surfaces of movable beams and stationary beams coplanar to each other (please see Figure 8) to make it functions as a reflector.

With regard to claims 7-10, Bloom et al teaches that red, blue and green modulation elements can be designed to diffract red, blue and green color of light *respectively*, (please see Figures 5-7, column 8, lines 28-37). This necessarily requires the dimensions of the square wells in different color modulation element to be different from each other in order for the different wavelength of light to be diffracted, (please see Figures 2-3 the explicit explanation of how the dimension of the square wells determines the diffraction of certain wavelength of light).

11. Claims 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harada et al (PN 5,078,495) in view of the patent issued to Furlani et al.

Harada et al teaches a monochromator that is comprised of a first mirror (2, Figure 1) for receiving the light from an entrance slit (1) and a second mirror (4) for reflecting light to a exit slit (5) and a grating reflector (3) for reflecting the light from the first mirror to the second mirror, (please see Figure 1). This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the grating reflector has the claimed structure. Furlani et al in the same field of endeavor teaches a grating reflector that is comprised of a *movable component* with a plurality of *cross beams* (20, Figures 1-6), coupled to *two long beams* (44) wherein the two long beams are *parallel* to each other and a *stationary component* that is comprised of a plurality of *protecting beams* (36) wherein the cross beams (20) and the stationary projecting beams (36) are alternatively disposed. Furlani et al teaches that the movable component is *actuated* to set up a plurality of *square wells* by make the difference in height distance between the cross beams and the stationary beams to be at a quarter of the wavelength of an incident light so that the light is diffracted by the square wells, (please see Figures 3 and 6, column 3, lines 45-67). It would then have been obvious to one skilled in the art to apply the teachings of Furlani et al to replace the grating reflector of Harada et al with the modulation diffraction grating of Furlani et

Art Unit: 2872

al for the benefit of providing a grating reflector with modulation control which therefore controls the quality of the spectrometer.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872*

A. Chang, Ph.D.